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Transdisciplinarity

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1. INTRODUCTION

Transdisciplinarity (TR) is part of a theoretical and practical effort to address the limitations of disciplines. In debates about the nature and organization of knowledge, it is typically contrasted with *disciplinarity* (Pohl & Hirsch Hadorn, 2007). Disciplines are cultural formations that function as agencies for the production, dissemination and application of *specialist* knowledge. Disciplines like Psychology, Biology, Sociology and Art History supply those who are trained in them (their *disciples*) with *disciplined* practices, socially recognized forms of authority (capable, for example, of annexing resources), distinct forms of professional identity, and so forth. This frees up resources for specialization, but specialization comes at the price of institutionalized *limitations* with respect to authorized questions, methods and other practices. No discipline is a static island. As products of ongoing human activity, disciplines are incompletions in process, each having some relation to what is outside of the limits formed by their borders. These borders include relations to other disciplines (*epistemological borders*); to undisciplined knowledge (*lay/expert borders*); to the real world environment of practical issues and problems (*pure/applied borders*); and to the matrix of the broader society that variously supports or challenges its activity (*science/society borders*). TR is associated with efforts to transcend these borders.

Between the hypothetical extremes of disciplinarity and TR, further distinctions are typically made between multidisciplinary and interdisciplinarity (cf. Nicolescu, 2002). Following this tradition, Stenner and Taylor (2008) define *multidisciplinarity* as approaching a problem in a coordinated fashion from various discipline-based vantage points, reserving the term *interdisciplinarity* for collaborations involving the transfer of concepts and/or methods from one discipline to another. In multidisciplinary, each discipline concentrates upon its own proper domain of abstraction and the aim is to enrich research by *combining* the fruits of such disciplinary knowledge in order better to approach a real world problem. An example would be a team of experts who divide their labour into the sociological, psychological and biological aspects of drug addiction. Interdisciplinarity, by contrast, involves transactions at the borders between disciplines (such as the transfer of methods) and hence involves *change*, including the emergence of new disciplines. The budding of cognitive neuroscience when new medical brain-imaging methods were incorporated into psychology, provides an example here. Multidisciplinarity would thus be closer to the ideal of disciplinarity, whilst interdisciplinarity is closer to that of transdisciplinarity (see Moran, 2002).

With *TR*, however, the transformation involved is taken further. The Latin prefix 'trans' means to move *across, beyond or through*. TR therefore suggests a combination of a) horizontal movements *across* disciplines, b) vertical movements

beyond disciplines, and c) diagonal movements *through* a discipline. Critical psychology, for example, is TR in these three related senses. Being critical of any tendency to abstract psychological processes (such as feelings, personality characteristics or modes of cognition) from their concrete social, historical and political circumstances, critical psychologists typically make the 'horizontal' move of engaging with disciplines like sociology, politics, anthropology and history. Horizontal movement across multiple disciplines, however, rarely entails the mere assembling of knowledge from different specialisms. Rather it provokes critical reflection on the relationships between, and on the limits of, these disciplines. This typically entails a corresponding vertical movement *beyond* specialist knowledge and towards a bigger picture integration of different knowledge types. This vertical dimension of a TR sensibility pertains to the longstanding philosophical to-and-fro between reductionism (stemming from a specialist concern with the concrete details of a limited disciplinary domain) and holism (concerned with general concepts which serve to express the interconnection of these domains). Thirdly, opening to these horizontal and vertical movements feeds-back into the critical stance towards the received discipline of psychology. This leads critical psychologists to cut diagonally *through* the discipline, *transforming* its knowledge and practices by meticulously revising its content and methods rather than simply remaining within its accepted borders.

This summary of three related modes of TR transformation focuses predominantly on *epistemological borders* concerning relations to other specialist disciplines. But debates about TR also involve practical and ethical dimensions that cut across other borders, especially *lay/expert* and *pure/applied borders*. Klein et al (2001), for instance, emphasize the pure / applied border when they assert that the core idea of TR should be that specialists from different disciplines work jointly with *practitioners* to solve real-world problems. For Gibbons et al (1994), TR is associated with a new mode of knowledge production (*mode 2 knowledge*) expressing a change in the nature of the science / society relationship (with closer alliances between industry, technology and science). Mode 2 knowledge contrasts with the supposedly pure and disinterested laboratory research of *mode 1 knowledge*. It moves towards knowledge practices that are inherently problem-oriented, but it is also about building a socially robust knowledge by incorporating into the research process the views and interests of all people with a stake in defining and solving the problem at issue. Here there are evident similarities with what Funtowicz and Ravetz (1993) call *post-normal science*.

The relationship between pure/applied and expert/lay boundaries is particularly acute in the case of psychology, since applications typically involve interventions into the conduct of lay people. Lay people are evidently stakeholders in this process, whether they be defined as deviant with respect to accepted norms (e.g. in need of attitude or behaviour change), or as norm setters. Here the word 'discipline' takes on a meaning associated with the work of Michel Foucault, for whom the disciplines are historically bound up with the history of technologies of governance and domination. It connotes regimes of power relations such as military discipline and the disciplining of school children, criminals, and others judged to deviate from

social norms. Critical psychologists have long drawn upon Foucault to expose the concrete historical ways in which the discipline of psychology has operated as part of a power/ knowledge complex (Rose, 1985). With respect to these practical dimensions, critical psychology would be TR to the extent that it takes a stand on issues of normativity and against oppression, working *with* lay participants rather than *on* them, and articulating its own normative agenda (Stainton Rogers et al, 1995). In transgressing lay/expert borders in this way, TR shades into participatory action research.

In sum, TR is a response to the limits of specialization: we are coming to know more and more about less and less, whilst the pressing problems that we face locally and globally do not do us the favour of posing themselves in ways compatible with disciplinary arrangements (Mittelstrass, 1993). This response has affected all disciplines, but given their relatively long-term engagement with the kinds of border transgressions associated with TR, critical psychologists have made notable contributions to its development (Maiers, 2001).

2. DEFINITION

Transdisciplinarity is a concept that has been used in efforts to describe integrative activity, reflection and practice that addresses, crosses and goes through and beyond the limits of established disciplinary borders, in order to address complex problems that escape conventional definition and intervention.

3. HISTORY

Although the term had occasionally been used before this date, 1994 was a watershed year for TR. In that year Basarab Nicolescu's Charter of Transdisciplinarity was announced at the First World Congress of Transdisciplinarity in Portugal (see Nicolescu, 2002); Michael Gibbons, Helga Nowotny and their group published *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*; and the Beryl Curt Collective published *Textuality and Tectonics: Troubling social and psychological science*, a work of critical psychology designed to explore 'the possibilities for new forms of transdisciplinary analytic craft and illustrate... their use in practice' (dust jacket comment). Each group appears to have independently invented a concept of TR. Gibbons, et al, for instance, use the word from the preface onwards with no reference to any prior tradition of use. With respect to Curt's usage, Brown (1995, 57) notes the absence of a glossary entry for TR, but identifies it as a concept 'made to order'. Nicolescu begins his *Manifesto of Transdisciplinarity* (published 8 years after the 1994 World Congress) by praising the 'pristine charm' of a term that has 'not yet been corrupted by time' (Nicolescu, 2002, 1), although he does note its prior use in the 1970s by Jean Piaget, Edgar Morin and Erich Jantsch.

Each of these versions has its distinct emphasis. Gibbons et al (1994) offer an empirical description of actual developments, with emphasis placed on the social utility of a transformed relationship between science and society in which problem-oriented knowledge is generated in its domain of application rather than first arrived

at in the pure space of the laboratory. Nicolescu's account, by contrast, is considerably more idealistic, intellectual and programmatic. Drawing inspiration from quantum theory, chaos theory and complexity theory, TR is about grasping multiple levels of reality thanks to a 'logic of the included middle' capable of grasping the emergence of complex plurality. Curt's account draws its inspiration from poststructuralist social theory. It emphasizes the disciplinary power of expert knowledge in an effort to revalue ordinary experience as part of a broader critical and egalitarian project of social transformation. Each version foregrounds transformation, but the first is an *empirical* description under the pragmatic sign of the *economy* (and mainly concerns the pure/applied borders), the second a *rational* proposal under the sign of future *truth* (mainly concerning the epistemological borders), and the third an *ethical* suggestion under the sign of a *politics of knowledge* (mainly concerning the lay/expert borders).

Any bigger picture history must note that many of the issues broached under the heading of TR would previously have been dealt with by philosophy as *metaphysics* (Stenner, 2009). Whitehead (1929, 86), for instance, saw metaphysics not as 'a mere juxtaposition of various sciences'. Instead, it 'generalizes beyond any special science, and thus provides the interpretative system which expresses their interconnection'. Metaphysics, however, might be considered to have died along with Whitehead around the middle of the 20th century. The batons of generality, integration and synthesis were then passed from philosophy to science, and were notably taken up by the proponents of *general systems theory* and *general structuralism*. Of those people credited with first using the word 'transdisciplinarity' in the early 1970s, it is thus no accident that Piaget (1972) was centrally associated with general structuralism, and Jantsch (1972) with general systems theory. The second wave of interest (i.e. that just crudely dated at 1994) corresponds in turn with what Curt (1994, 4) called the 'climate of propletization' associated with *post-structuralism* (largely in the social sciences and humanities), and with complexity oriented critiques of systems theory (largely in the natural sciences), and hence with a postmodern loss of faith in a generalized scientific cosmology.

4. CRITICAL DEBATES

Unsurprisingly, critical debates tend to be structured around the value attributed to disciplinarity. Those who value the clarity, focus and security provided by disciplines may perceive transdisciplinarity to be at best a muddle and at worst a threat, whilst those who associate disciplines with an anti-creative repression of possibilities will think differently. The situation is complex. Change and transformation are not always for the best, and what for some commentators is an effort to make ivory tower research more relevant to ordinary people, is for others a neo-liberal challenge to the autonomy of science, pushing researchers to be accountable to stakeholders in business and government. Strathern (2004) takes on something of this stance when she discusses challenges to disciplinarity as part of a broader context in which science is being made subservient to the industrial requirements and market demands of a thoroughly monetized knowledge economy. Building on Strathern's work, but also based on an empirical study of various different cases of

inter and TR collaboration, Barry et al (2008) identify three interconnected 'logics' at play. The first is the logic of accountability just touched upon (a logic which can resonate with corporate quality control), and the second is a logic of innovation: 'a spectrum of arguments about how scientific research can be expected to contribute to industrial innovation and economic growth' (Barry et al, 2008, 24). Together these logics indeed point to the ways in which a neo-liberal alliance of business and government has sought to appropriate and maximize the economic value of scientific knowledge. This process is evident in the increasing demand that research must demonstrate its economic impact and build measures of impact into its self-justification (cf. the UK Government's Research Excellence Framework). In this context, defending disciplinarity against TR can take on the connotation of defending truth itself from corporate take-over. However, Barry et al resist the temptation of reducing TR to such external political and economic directives alone, asserting the relevance of a third logic that they call 'ontological', since it concerns genuine changes in ways of conceiving reality.

Another contentious issue concerns the extent to which disciplines are in fact self-contained and homogenous units and, correspondingly, whether TR in practice actually is open, fluid and heterogeneous. Galison (1996), for instance, draws attention to the heterogeneous and often conflicted nature of disciplines in general. More specifically, Danziger (1990) maps the conflicting multiplicities at play in the discipline of psychology, and Good (2000) does the same for the sub-discipline of social psychology. TR, by contrast, can sometimes appear as a monotonous set of promised transformations eternally repeated but never actually delivered. Building on Curt's (1994) tradition of critical psychology, Brown (1995, 59) offers the alternative of viewing disciplinarity and TR, not as separate empirical realities or distinct developmental stages, but as 'moments or conditions that any discipline may approximate'. Discipline and TR would then not be separate identities, but distinguishable tendencies in a unified mixture. Disciplinarity is always moving beyond itself but two ideal-typical possibilities can be abstracted: 1) a highly bounded state of *disciplinarity* in which all of the relevant elements of knowledge are thoroughly compartmentalized and fixed in a well defined space capable of being clearly and rapidly surveyed by specialists, and 2) an unbounded *transdisciplinarity* in which such elements and structures are in a flux of becoming that escapes disciplinary knowledge (Motzkau, 2009). TR would then be the transformation of what is established by disciplinarity, and vice versa. These two scenarios map onto two distinguishable modes of advancement. The first proceeds in a 'quantitative' sense, by gathering ever more details into an already established pattern. The second proceeds 'qualitatively' through the transformation of an established pattern and the creation of a new pattern (Stenner, 2012). TR would therefore be concerned with the dynamism of forces at work in such transformations (Brown & Stenner, 2009), or with 'the dynamic of change /becoming /event itself... at the exact moment at which something happens... the moment in which one thing becomes another thing' (Motzkau, 2011). In this scenario (which these authors call a *transdisciplinary psychosocial approach*), disciplinarity and TR would be abstractions to which no empirical reality exactly conforms, but which exist in a relation of mutual presupposition, as settled 'structure' and liminal 'anti-structure'.

5. INTERNATIONAL RELEVANCE AND FUTURE DIRECTIONS

It is easy to predict that issues associated with TR will become more acute and internationally relevant in the coming years. Calls for TR will become more extensive as scientific practice continues to globalize, and as global problems associated with human rights (such as health, inequality and violence), with energy needs (such as depleting oil resources), and with the non-human environment (e.g. global warming) continue to intensify. Such pressing real-world problems evidently demand scientific activity which: grasps the complexity of problems; moves beyond, across and through disciplinary boundaries; engages scientific knowledge with the manifold politics of practice; grapples with diverse life-world and scientific perceptions of problems; links speculative and concrete types of knowledge; and orients all this towards the promotion of the common good (Pohl and Hirsch Hadorn, 2007).

It is notable in this respect that much TR activity is authorized by prominent international organizations. The United Nations Educational Scientific and Cultural Organization, for instance, have hosted and sponsored a number of conferences and publications (see UNESCO, 1998), and - in researching for this Encyclopaedia entry - the earliest use of TR discovered was connected with the Union for International Associations, Brussels (Judge and Clark, 1970). The 1972 use of the TR word by both Jantsch and Piaget was part of an OECD document (Organization for Economic Cooperation and Development). To give a final example, Patricia Rosenfield - a leading advocate of TR in the health field - was responsible for the Social and Economic Research Steering Committee of the World Health Organization (Kessel and Rosenfield, 2008). In the context of this growing international activity, it is easy to lose sight of some of the TR specificities proper to psychology, and to *critical* psychology in particular. There is a subjective dimension to all of these problems, and that dimension is not reducible to the individual-centred psychologism of conventional psychology (Nicolescu, 2002). The key future direction for critical psychology in the context of TR concerns an articulation of that experiential dimension that gives due attention to its social and natural context, whilst reducing it to neither (Maiers, 2001).

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7. ON-LINE RESOURCES

td-net network for transdisciplinary research:

<http://www.transdisciplinarity.ch/e/Transdisciplinarity/>

Nicolescu's Charter of Transdisciplinarity:

<http://basarab.nicolescu.perso.sfr.fr/ciret/english/charten.htm>

A holistic education network with a focus on Transdisciplinarity

<http://www.hent.org/transdisciplinary.htm>

8. LIST OF KEYWORDS

Disciplinarity

Interdisciplinarity

Multidisciplinarity

Borders

Boundaries

Metaphysics

General Structuralism

General Systems Theory